

DRUG DELIVERY STENT

ABSTRACT OF THE DISCLOSURE

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An implantable stent comprises a tubular member having an interior surface and an exterior surface, with a region of at least one of the surfaces being hydrophobic. The region is provided with an array of microstructures or nanostructures that covers first portions of the surface but leaves second portions exposed in the interstices of the array. These structures
10 cause the region to have a dynamically controllable hydrophobicity. In one embodiment, a control device, which is affixed to the tubular member, varies the hydrophobicity of the region. In another embodiment, which is particularly applicable to the delivery of a medicinal substance to fluids in body vessels, the stent also includes such a medicinal substance that adheres to the exposed portions until the control device alters the hydrophobicity of the region
15 and causes the substance to be released into a body fluid in contact with the stent. Various ways to load the stent are described. In yet another embodiment, the tubular member is provided with a mechanism that enables the shape of the stent (e.g., its diameter) *in vivo* to be controlled dynamically, again by means of external wireless communication. In one more embodiment, sensors are affixed to the tubular member to enable fluid parameters (e.g.,
20 pressure, flow rate) to be monitored remotely.